Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the	)	
Commission's Rules to Permit	)	WT Docket No. 11-69
Terrestrial Trunked Radio (TETRA)	)	
Technology	)	
	)	
Request by the TETRA Association for	)	
Waiver of Sections	)	ET Docket No. 09-234
90.209, 90.210 and 2.1043 of	)	
the Commission's Rules	)	
	)	

REPLY COMMENTS OF THE TETRA ASSOCIATION

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SUMMARY

Opponents of TETRA, apparently attempting to limit TETRA's potential for increased competition in the United States, continue to raise spurious issues and concerns about the use of TETRA. These parties, however, fail to offer any credible argument why the Commission should single out TETRA for any different treatment from that accorded other digital technologies operating under Part 90 of the Commission's rules.

TETRA should not be classified as a high density cellular system and no additional limits should be placed on TETRA due to unfounded interference concerns. In terms of the relevant station identification rules, while the Association supports updating those rules for today's digital technologies, that is an issue for another proceeding. The Association does agree, however, that the FCC should adopt the use of the TETRA filter for ACP measurement purposes.

Given the TETRA Association's repeated assurances that it has no intention of marketing TETRA to public safety entities, or otherwise attempting to supplant Project 25 technology as the technology of choice for public safety interoperability in this country, the alarms raised about TETRA interference to public safety operations are ill-founded. TETRA should be allowed to operate on any Part 90 frequency for which the technology can meet general Part 90 requirements.

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REPLY COMMENTS OF THE TETRA ASSOCIATION

The TETRA Association (the "Association") hereby responds to comments filed with regard to the Notice of Proposed Rulemaking ("NPRM") in which the Federal Communications Commission ("Commission" or "FCC") proposes to adopt rules designed to allow Terrestrial Trunked RAdio ("TETRA") devices to operate in the United States.[1] Comments and other information in the record support the Association's position that the Commission should adopt rules allowing for TETRA operations, without imposing unnecessary constraints.

I. DISCUSSION

In the NPRM, the Commission sought comment on two distinct issues: whether the proposed technical rules would allow TETRA systems to operate without causing interference to existing users, and how deployment of TETRA technology could affect public safety interoperability.[2] No comments have been filed that would dissuade the FCC from adopting

[1] *Amendment of Part 90 of the Commission's Rules to Permit Terrestrial Trunked Radio (TETRA) Technology; Request by the TETRA Association for Waiver of Sections 90.209, 90.210 and 2.1043 of the Commission's Rules*, Notice of Proposed Rulemaking and Order, WT Docket No. 11-69 and ET Docket No. 09-234, 26 FCC Rcd 6503 (2011) ("*NPRM/Order*").
[2] NPRM/Order at ¶ 8.

rules to allow for TETRA operations.[3] Contrary to some parties' assertions,[4] there are many benefits to TETRA, which could well be lost if unnecessary constraints are applied to use of the technology. In terms of efficient use of spectrum and unparalled functionality, TETRA provides an ideal technology. TETRA systems, for example, are significantly more spectrally efficient than individual systems that are required to "listen" on a channel to determine its availability before transmitting.[5]

A number of parties support the proposed rules. Cassidian, one of the most experienced suppliers of TETRA and other technologies worldwide, supports the proposed rules based on its vast experience of supplying systems using a variety of technologies.[6] Cassidian notes that interoperability between TETRA and other system architectures is "clearly achievable."[7] Harris supports the Commission's proposed rules regarding authorized bandwidth and emissions masks.[8] Motorola agrees that "existing coordination procedures are adequate."[9] And 4765 Oak Hill Partnership explains that, "[t]he introduction of TETRA technology, by itself, into the land mobile radio bands does nothing to improve interoperability or distract from interoperability, any more or less than the introduction of any technology solution into any of the land mobile radio bands."[10]

A. TETRA Need Not be Restricted

The Association's application for waiver,[11] as well as other materials submitted in the waiver proceeding, showed that TETRA transmissions would not cause harmful interference to other users. The FCC, after evaluating the interference risks, agreed, and granted the

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[3] The Association notes that Industry Canada recently has revised its RS119 to allow for TETRA operations in Canada.
[4] *See* Comments of the Project 25 Technology Interest Group.
[5] Harris discusses the availability of DMR products in the U.S., Comments of Harris at 2-3, but DMR is a low functionality technology designed to replace analog radios and does not provide users with TETRA's high degree of functionality, such as high security encryption, high call handling, mobility management, and other benefits.
[6] Comments of Cassidian Communications, Inc. at 2.
[7] *Id*. at 10.
[8] Comments of Harris Corp. at 7.
[9] Comments of Motorola Solutions, Inc. at 14.
[10] Comments of 4765 Oak Hill Partnership at 8.
[11] *Request by the TETRA Association for Waiver of Sections 90.209, 90.210 and 2.1043 of the Commission's Rules*, Request for Waiver, ET Docket No. 09-234 (filed Nov. 20, 2009) ("Waiver Request").

Association's Waiver Request so that TETRA devices may now be certified in the U.S.[12] Nonetheless, out of an abundance of caution, the Commission sought comment on certain technical issues prior to finalizing the rules.

While certain comments appear prompted primarily by fear of competition from TETRA, the Association will address the points raised in turn.

1. TETRA Should Not be Classified as a High-Density Cellular System.

The Association has addressed in previous filings the idea of classifying TETRA technology as a High Density Cellular System and has established that, because TETRA generally has large cell sizes, it should not be considered a High Density Cellular System.[13] Further, as Motorola notes, the FCC's definition of these systems is based in part on cell hand-off capability, a feature not supported by TETRA networks.[14] Additionally, the comparatively low population density of professional radio users and the need for cost effective system solutions make it highly unlikely that TETRA would be deployed using small cell sites. However, even if this were to occur, the Part 90 power level rules are based on antenna height, alleviating low site/high site interference concerns.

Nonetheless, a number of parties continue to argue that TETRA should be characterized as a High Density Cellular System.[15] The primary argument is that TETRA systems will perform like Nextel, which used a 6 slot TDMA technology to create a cellular network, creating interference problems that arose from their use of iDEN technology. This argument is false on several grounds. First, TETRA technology cannot be compared to the iDEN technology used by Nextel. While iDEN provided 6 slots in 25 kHz, TETRA only provides 4 slots. Moreover, TETRA's adjacent channel performance is significantly better than iDEN and the problems created by iDEN would not, therefore, be replicated by TETRA. Second, the Association is not

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[12] NPRM/Order at ¶ ¶ 20-24. Some lower-power TETRA devices were certified prior to the grant of the waiver, but the waiver allows for certification of full-power TETRA devices.
[13] *See* Reply Comment of the TETRA Association, ET Docket No. 09-234, at n.17 (filed Jan. 29, 2010).
[14] Comments of Motorola Solutions, Inc. at 13.
[15] *See* Comments of EF Johnson Technologies, Inc. at 2; Comments of Harris Corp. at 2; Comments of APCO at 3.

proposing that TETRA be used to create high capacity public cellular networks and, as discussed further below,[16] does not believe this would occur. Therefore, deployment of TETRA would not be undertaken in a similar manner to Nextel's iDEN system, and the implied similarities would not exist. Utilities, transportation and other interested LMR users mostly likely will optimize system design for coverage using high sites and not the low-power, low site distribution that is used by public cellular systems. Third, the deployment of TETRA is not restricted to large-footprint, high-capacity systems, as implied by several parties. In fact, there are many deployments of TETRA that use only a small number of sites.

Indeed, TETRA can be economical with only a single base station delivering a control channel and three traffic channels over an area with a radius of around 25 miles. With data on the control channel and three voice or data communications on the traffic channels, this represents a very efficient use of 25 kHz of spectrum and is consistent with the spectrum efficiency objectives of the FCC. This is not an unusual situation and can hardly be termed "High Density Cellular Systems."

Cassidian supports the view that TETRA systems are typically employed to provide wide area coverage systems using large cells with antenna heights similar to current analog LMR, other digital LMR and P25 technologies, and explains that TETRA networks as proposed do not meet the Section 90.7 definition of High Density Cellular Systems.

2. Near/Far Issues.

NPSTC, EF Johnson, and others again express concern for the potential for near/far interference if TETRA is deployed in low-site, cellularized configurations.[17] While the potential for near/far interference always exists, TETRA is a very different technology from that employed by Nextel, which was designed as a high-capacity public cellular system, and it is unreasonable to imply that similar issues would occur with TETRA use.

[16] *See* Section IA2.
[17] Comments of NPSTC at 6; Comments of EF Johnson at 2.

As discussed in previous filings,[18] TETRA devices are used like other land mobile radio systems in that TETRA is deployed from tall transmission sites and uses large coverage areas or cells. It is highly unlikely that a TETRA system would be deployed using small cells. The population of professional land mobile users is restricted and much less than the population of cellular users, and thus there is no need for the capacity associated with small cell TETRA use. Moreover, such deployment is costly due to the large number of base stations required, and given the limited number of users it would not be economically feasible to deploy TETRA with a small cell design. But even if a TETRA system were built using small cell deployment, any resulting near/far interference would be quite unlike the Nextel experience because the TETRA emission curve differs significantly from the Nextel emission curve. The shell of influence would be much narrower with a TETRA system compared to a Nextel system, significantly reducing the near/far interference potential.

3. Other Interference Concerns.

Motorola, in concert with other commenters, continues to raise concerns about the interference potential of TETRA systems.[19] For example, Motorola argues that the experience of TETRA operations in other countries cannot be considered here, where tightly packed channels create a different operating environment. The Association notes, however, that recent TETRA pilot projects in the U.S. have produced no evidence of interference impacting users of other technologies in those locations during the trials.[20] Motorola also questions the Association's use of the TSB-88 based analysis, and along with other parties questions the FCC's proposed occupied bandwidth of 22 kHz and an adjacent channel coupled power ratio (ACCPR), arguing that these measures would result in less interference controls than currently allowed under the rules.

The Association disputes the suggestion that its interference analysis is inaccurate or invalid, and notes that the FCC determined that this analysis is useful and sufficient to support

[18] Reply Comment of the TETRA Association, ET Docket No. 09-234, at n.17 (filed Jan. 29, 2010).
[19] *See e.g.*, Motorola Comments at 5-9; Comments of NPTSC at 3-4; Comments of the Project 25 Technology Interest Group.
[20] Trials have occurred in Green Bay, Wisconsin, and with New Jersey Transit. *See* Comments of Nielson Communications (filed Aug. 9, 2011) (describing the results of their trials in Green Bay).

grant of the waiver.[21] Moreover, interference potential will increase when narrowbanding occurs, regardless of technology used. To put to rest the arguments that TETRA would cause an unacceptable risk of harmful inference, the Association provides the following response.

a. Occupied Bandwidth.

It has been suggested that the proposed increase in occupied bandwidth for TETRA will degrade interference protection. It is very relevant to consider the frequency stability impact on maintaining the transmission signal within its assigned channel and without interference on adjacent channels for all temperatures and voltages in the equipment working ranges. Although under the proposed rules the occupied bandwidth is increased from 20 kHz to 22 kHz, in fact the effective occupied bandwidth (taking into consideration the authorized shifts of carrier frequency due to temperature and voltage specifications under the FCC rules) is higher for the current specified limit (20 kHz) than that proposed for TETRA (22 kHz) when taking account of the TETRA frequency stability. This is reflected as follows:

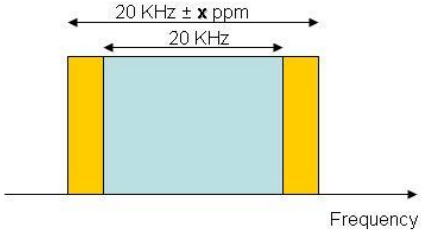
	Data for $F_{carrier}$=470 MHz	
	$BW_{occupied}$ WITHOUT authorized frequency shift	$BW_{occupied}$ WITH authorized frequency shift (±5ppm)
Current FCC Limits	20 kHz	24.7 kHz
New FCC Limits with TETRA frequency stability	22 kHz	22.2 kHz

ETSI limits for frequency stability are significantly tighter than the Part 90 limits,[22] as is shown in following figures.[23] And, as has been noted, the proposed occupancy is actually less than that already accepted when shifts due to voltage and temperatures are taken into account. For this reason, the Association's interference analysis is valid.

[21] NPRM/Order at ¶ 9.
[22] 47 C.F.R. § 90.213.
[23] Frequency stability in TETRA is defined: 1) for Base Stations (BS) by ETSI EN 300 392-2 V3.2.1 Section 7.7; and 2) for Mobile Stations (MS) WITH Automatic Frequency Control (AFC) – Lock onto BS by ETSI EN 300 392-2 V3.2.1 Section 7.8 and WITHOUT Automatic Frequency Control (AFC) – Do not lock onto BS by ETSI EN 300 396-2 V1.3.1 Section 7.4.

About TETRA & Occupied Bandwidth (&90.209) & Frequency stability (&90.213)

X is expressed in ppm and section &90.213 (Stability Frequency) sets limits for this parameter in temperature and voltage ranges.



MINIMUM FREQUENCY STABILITY
[Parts per million (ppm)]

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
Below 25	[1,2,3] 100	100	200
25–50	20	20	50
72–76	5	.....	50
150–174	[5,11] 5	[6] 5	[4,6] 50
216–220	1.0	.....	1.0
220–222 [12]	0.1	1.5	1.5
421–512	[7,11,14] 2.5	[8] 5	[8] 5
806–809	[14] 1.0	1.5	1.5
809–824	[14] 1.5	2.5	2.5
851–854	1.0	1.5	1.5
854–869	1.5	2.5	2.5

Mobile Terminal

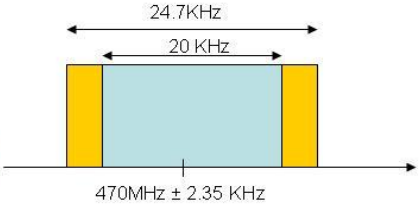
Limits for Stability Frequency (25KHz channel Spacing) are:

-**For 421-512MHz: ± 5 ppm**

For example: $F_{carrier}$= 470MHz ± 2.35KHz

Therefore $BW_{occupied}$=20KHz + 2 *2.35KHz= 24.7KHz

(Occupied Bandwidth for all conditions (temperature / voltages)

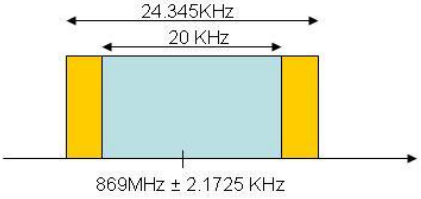


-**For 800MHz: ± 2.5 ppm**

For example: Fcarrier= 869MHz ± 2.1725KHz

Therefore BWoccupied=20KHz + 2*2.1725KHz = 24.345KHz

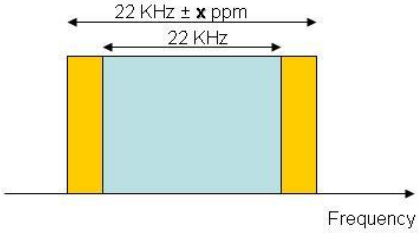
(Occupied Bandwidth for all conditions (temperature / voltages)



About TETRA & Occupied Bandwidth (&90.209) & Frequency stability (&90.213)

New proposal Occupied bandwidth of 22 KHz and TETRA Stability Frequency:

X is expressed in ppm and section &90.213 (Stability Frequency) sets limits for this parameter in temperature and voltage ranges.



But Stability Frequency in TETRA is defined by:

A) Mobile terminals:

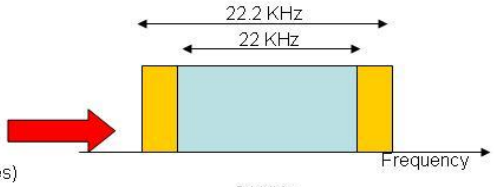
- With AFC (To lock onto BS – Trunked mode V+D): ± 100Hz (ETSI EN 300 392-2 V3.2.1 Section 7.8)
- Without AFC(Do not lock onto BS- Direct Mode DMO): ±1 KHz (ETSI EN 300 396-2 V1.3.1 Section 7.4)

B) Base Stations (ETSI EN 300 392-2 V3.2.1 Section 7.7)

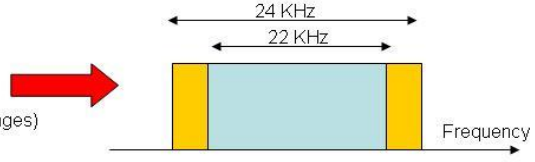
- Below 520MHz: ± 0.2ppm
- Above 520Mhz: ± 0.1ppm

-**Mobile Terminal**

A) WITH AFC (Lock onto BS) (Usual working mode)
Fcarrier= 470MHz ±100 Hz
Therefore BWoccupied=22KHz + 2 *100Hz= 22.2KHz
(Occupied Bandwidth for all conditions (temperature / voltages)



B) WITHOUT AFC (Do NOT Lock onto BS)
Fcarrier= 470MHz ±1KHz
Therefore BWoccupied=22KHz + 2 *1KHz= 24KHz
(Occupied Bandwidth for all conditions (temperature / voltages)



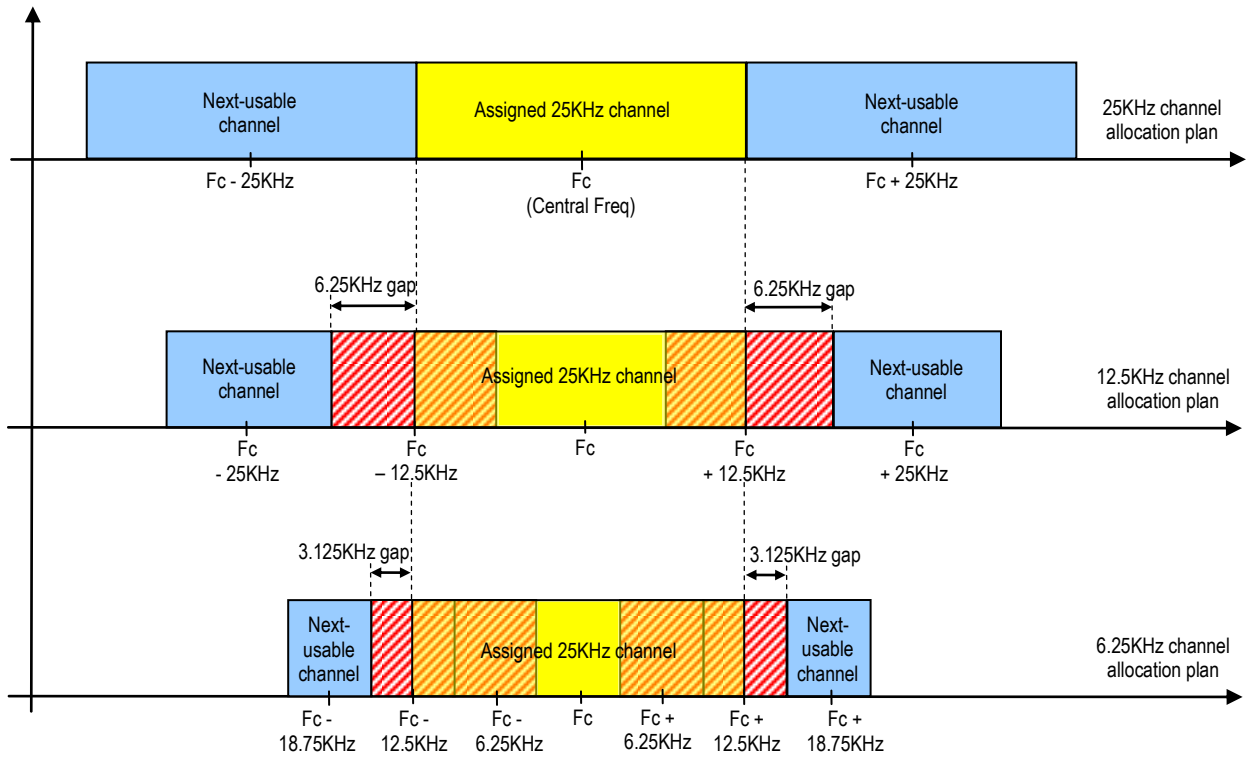
b. ACCPR

The modeling submitted by Motorola concerning TETRA ACCPR creates confusion rather than clarity. Until the narrowbanding process is complete, TETRA can fit in the present channel plan and the modeling that the Association used to calculate ACCPR is valid. After narrowbanding is complete, it may be true that frequency coordination or physical separation will be necessary, as is likely true for other technologies. However, TETRA's use of four 6.25 kHz channels is spectrally efficient, and TETRA does not perform significantly different from other technologies that have been authorized by the Commission.

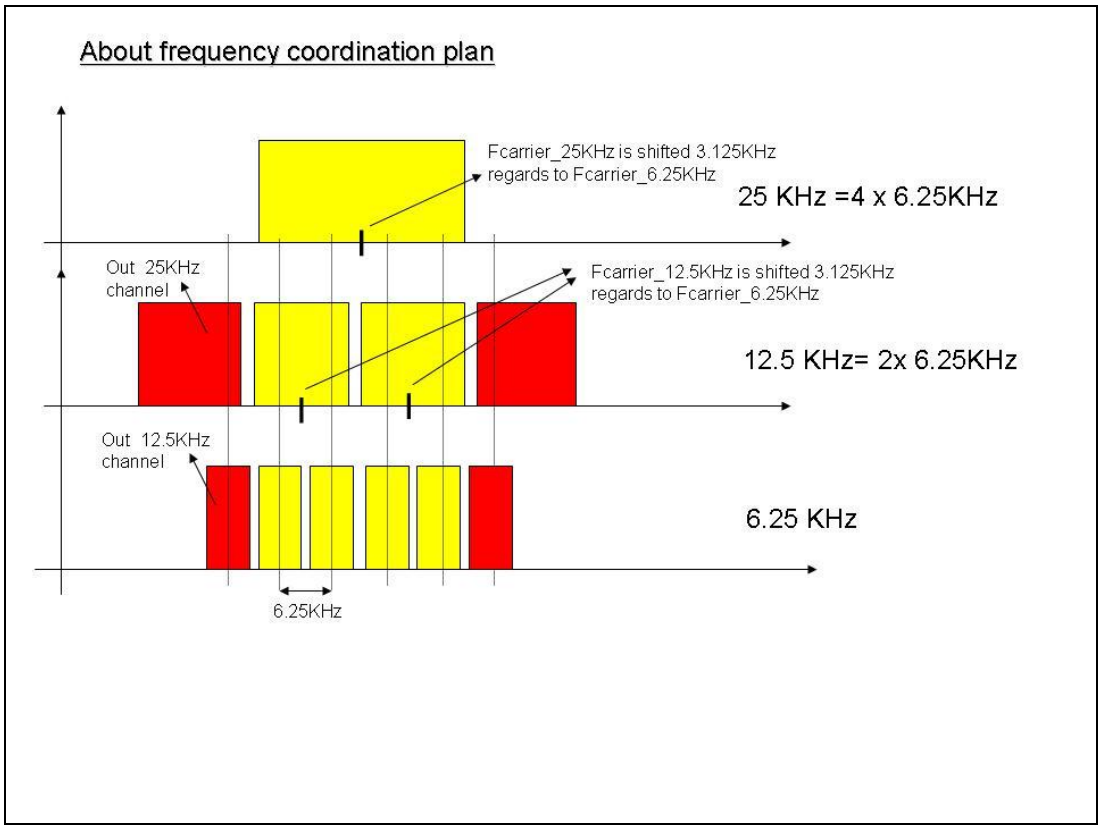
The Association's ACCPR modeling is valid and consistent with the approaches used in TSB-88 for both TETRA and other technologies, namely putting the victim receiver in the channel adjacent to the emitter. Under the current frequency coordination plan, the maximum frequency offset from a TETRA carrier is 18.75 kHz for 6.25 kHz channels and 25 kHz for 12.5 kHz and 25 kHz channels. Therefore, it is not necessary under the present frequency plan to perform an ACCPR analysis at frequency offsets under 18.75 kHz.

The below diagram indicates permissible allocations for 6.25 kHz and 12.5 kHz channels when combined with a 25 kHz channel. Note that, when two adjacent channels with different bandwidths are used, guard bands result:

Channel allocation under current FCC frequency coordination plan



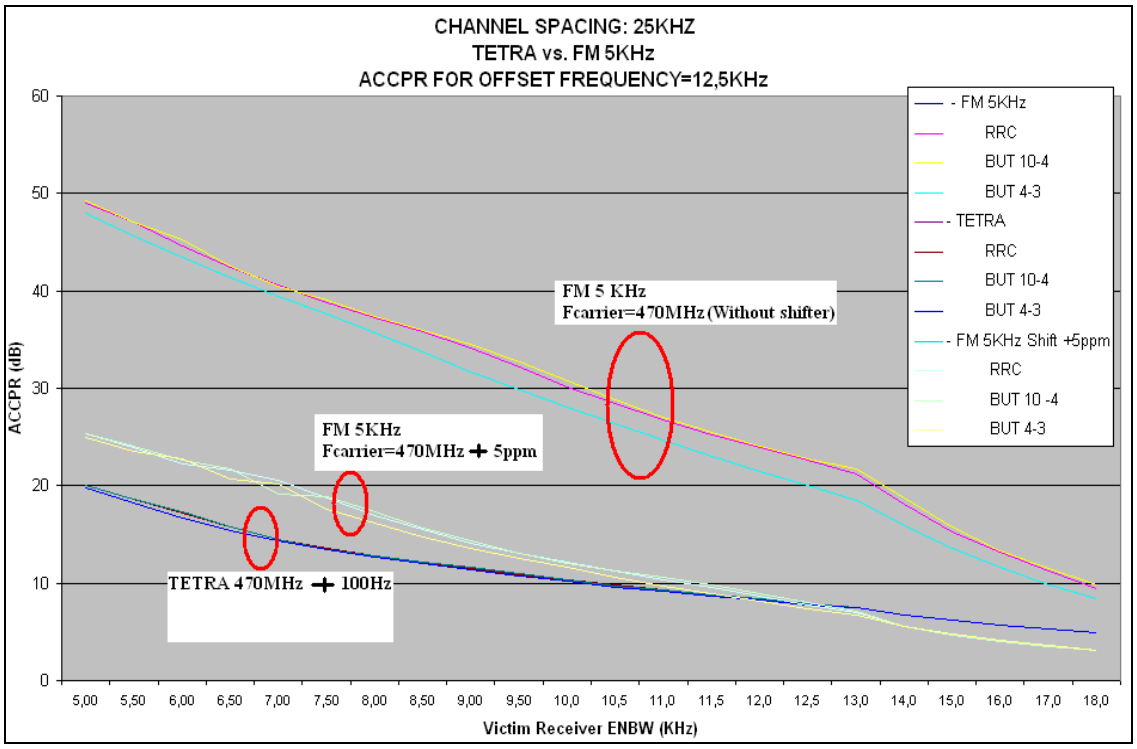
The Association also notes that under a modified frequency plan, with a small movement of 3.124 kHz in the center frequency, a more efficient incorporation of TETRA can be accomplished:



Motorola argues that "[w]ith TETRA centered in a 25 kHz channel, the spacing to the first adjacent 12.5 kHz bandwidth channels is 12.5 kHz. Using the same TSB-88 analysis, the ACCPR between TETRA and a typical narrowband analog FM receiver at 12.5 kHz spacing is very high at 13.0 dB – a level that would introduce more potential interference and dictate the need for more adjacent channel coordination."[24] Even under Motorola's scenario (12.5 kHz offset frequency within 25 kHz TETRA channel), TETRA does not create more interference potential than other technologies authorized by the FCC. Using the same model as Motorola, but taking frequency stability into consideration to estimate ACCPR, the results are very different. Even though 12.5 kHz is not a suitable offset, to check the relevance of the frequency stability in the ACCPR estimate, the following example for a 12.5 kHz offset frequency is shown using the same TSB-88 analysis:[25]

[24] Comments of Motorola Solutions, Inc. at 6.

[25] Three different groups of curves are defined: three curves with different receiver filters (RRC α=0.2 / Butterworth 10p4c / Butterworth 3p4c) for 2 Tone Analog FM modulation with deviation 5 kHz (Channel Spacing=25 kHz) WITHOUT shifter for carrier frequency; three curves with different receiver filters



Even in these conditions (12.5 kHz offset frequency within 25 kHz TETRA channel), ACCPR is 13dB for TETRA, but for FM 5 kHz with maximum authorized shifter (5ppm) is about 17dB, not much better than TETRA, and 25 kHz FM is certified by FCC. Therefore, based on these calculations, based on the experience of field trials already held in the United States, and based on the significant worldwide experience of TETRA co-existing with other technologies, there is no risk of harmful interference from TETRA to existing technologies in the United States.

c. Intermodulation Interference.

Harris claims that the FCC has failed to conduct an intermodulation interference analysis.[26] There is, however, no reason to do so and no evidence that TETRA systems would generate high levels of interference. Indeed the number of intermodulation products increases with the number of carriers. With a single TETRA carrier carrying the equivalent of four FDMA

(RRC α=0.2 / Butterworth 10p4c / Butterworth 3p4c) for 2 Tone Analog FM modulation with deviation 5 kHz (Channel Spacing=25 kHz) WITH maximum authorized shifter for carrier frequency (5 ppm for 470 MHz → 2.35 kHz); three curves with different receiver filters (RRC α=0.2 / Butterworth 10p4c / Butterworth 3p4c) for TETRA modulation (Channel Spacing=25 kHz) WITH maximum shifter (± 100Hz).

[26] Comments of Harris at 5.

carriers one could argue that TETRA will generate less intermodulation than P25. Even if a TETRA base station would create unacceptable levels of intermodulation interference, standard RF engineering techniques such as the use of isolators can be employed.

d. Co-Channel Interference.

EWA argues that the FCC should have addressed co-channel interference concerns in granting the Association's Wavier Request, and that it should have done so because some Part 90 channels, especially those below 512 MHz, are shared.[27] EWA further states that, if TETRA is not able to monitor channels, deployment must be limited to certain trunked operations below 512 MHz that are exempt from monitoring requirements.[28] The Association agrees with EWA that TETRA is not suitable for operating in shared channels. For this reason, it does not believe that the FCC would approve TETRA equipment for shared channels, nor would a TETRA system be approved by a frequency coordinator for co-channel use. Thus, the Association sees no reason for the FCC to address this issue in this proceeding.

4. Station Identification.

TETRA base stations do identify themselves, but in digital format not in analog or Morse code. This seems to be the case for other digital technologies such as DMR. The Association therefore supports Motorola's request that the Part 90 rules be revised to allow the transmission of station identification in digital mode on shared channels for frequencies below 512 MHz. However, it would be more appropriate for the Commission to address this issue in the pending Part 90 rulemaking proceeding, where it is being considered by the Commission and where a full record has been developed on the issue. The Association believes that TETRA should be treated the same as other technologies.

5. Use of the TETRA Filter for ACP Measurement Purposes.

PowerTrunk notes that, for measurement purposes, the FCC must provide for the use of a TETRA filter for Adjacent Chanel Power ("ACP") limit measurements, as ETSI measurement requirements differ from FCC requirements, and use of the FCC measurement would result in

[27] Comments of EWA at 4-5.
[28] Comments of EWA at 5.

different ACP values.[29] The Association agrees with this suggestion and requests that the FCC adopt the ETSI measurement standard so that TETRA systems in the U.S. comply with the worldwide TETRA standard. Given that the FCC has determined that TETRA poses no increased risk of adjacent channel interference, there is no need to create a unique variant of the standard for the U.S. market. Doing so would be contrary to the public interest as it would result in diminished benefits of introducing TETRA to the U.S.

For these reasons, the Association also opposes the suggestions by Motorola regarding creating a generic measurement method for ACCPR.[30]

B. Public Safety – Interoperability and Other Issues.

The FCC also sought comment on how TETRA deployment may affect public safety interoperability. The Association already has stated publicly and in its Waiver Request and subsequent filings that it recognizes the decisions made by the public safety community to adopt Project 25 technology in a harmonized manner and that, despite public safety being the largest user of TETRA elsewhere in the world, the Association will not promote TETRA to the public safety sector. Indeed, the Association's Waiver Request did not specify 700 MHz as a required band.

The Association believes that concerns about the compatibility of TETRA with Project 25 are quite separate from the technical rules and concern frequency coordination rather than interference protection. Moreover, if FCC rules, such as those pertaining to mutual aid or 700 MHz public safety band operations, do not allow for TETRA operations, then TETRA cannot be deployed. Conversely, if a TETRA system meets the rules, then TETRA deployment should be allowed. It therefore is unnecessary to require the FCC to issue a specific ban on TETRA devices in this rulemaking.

With TETRA systems in the U.S., the question of interoperability concerns interoperability between critical infrastructure suppliers and first responders. APCO and NPSTC expressed concern that Critical Infrastructure Industries ("CII") may be exploring the use of TETRA, and that use of TETRA by CII would hamper public safety emergency

[29] Comments of PowerTrunk, Inc. at 1.
[30] *See* Comments of Motorola Solutions, Inc. at 10-11.

communications.[31] We believe that utilities and other critical infrastructure industries should explore all available technologies and choose whichever technology meets their requirements at an affordable cost.

Procurement in a competitive environment is surely in the interests of the U.S. consumer. Where interoperability is necessary with public safety personnel, gateways or even dual-mode handsets can provide this ability if and when required. Indeed, the need for CII/public safety interoperability will be an infrequent rather than a large-scale, critical requirement. Thus, it can be handled by inter-system gateways, either automatically or through a command center or control room. Such interconnection can be achieved regardless of the technology used for the two radio systems. CII organizations should be free to choose the most appropriate technology solution for their operations.

The FCC also specifically sought comment on whether TETRA technology should be permitted on the Public Safety Pool frequencies.[32] The Association concurs that TETRA should not be used on frequencies where the user is not eligible for a license or where the technology cannot meet other Part 90 requirements not addressed in the Waiver Request or this rulemaking. Beyond this, however, TETRA operations should not be limited any more than other digital Part 90 technologies.[33] As previously noted, other digital technologies (such as DMR, MOTOTRBO, dPMR, Opensky, etc.) are deployed in Part 90 spectrum and are not restricted in a way that some parties propose restricting TETRA. Moreover, as NPTSC discusses,[34] the Part 90 rules set out various equipment certification requirements for public safety devices. The FCC equipment certification process, which requires any party seeking equipment certification to certify that the device meets all applicable FCC rules, assures that no TETRA device that fails to comply with Part 90 will be certified. For this reason as well, there is no need to impose superfluous limits on TETRA in this proceeding. There is demand for TETRA by a number of users – for example, transport authorities, private security companies, utilities, and transportation (ports and airports,

[31] Comments of APCO at 3; Comments of NPSTC at 6.
[32] NPRM/Order at ¶ 14.
[33] The idea that TETRA should undergo another standards review process is absurd. *See* Comments of TIA. Moreover, contrary to TIA's assertions, the public safety community was involved in the ETSI development of the TETRA standard.
[34] Comments of NPSTC at 5.

buses and rail) – and limiting TETRA would not be in the public interest as it would reduce the choice and competitive environment that users in the U.S. deserve.

In terms of narrowbanding concerns, and Harris' claim that TETRA is not compatible with 12.5 kHz channel frequency plans,[35] commenters fail to consider that TETRA operates on four-slot, 6.25 kHz channels. As a result, the standard can well meet the public safety and other narrowband requirements.

Concerns expressed about TETRA operations on mutual aid channels are a red herring.[36] TETRA DMO does support infrastructure free calls, and the P25 Group is incorrect in stating that it does not. However, given that mutual aid channel operations are defined for analog radios, and given the cost of making dual-mode TETRA devices to address this particular need, it is unlikely any such radios would be commercially viable in the U.S. unless TETRA achieves great market penetration.

II. CONCLUSION

The Association is grateful to the FCC for embarking on this rulemaking process and hopes that it will enable users in the U.S. to take advantage of TETRA technology where it is appropriate. The Association believes that the issue of high/low site or near/far issues and previous problems with Nextel have no basis in fact. These issues concern how a network is engineered rather than the technology that is employed.

The Association has publicly committed not to promote TETRA into public safety markets and does not expect to have access to channels that are designated as public safety use only. We do not believe that it is appropriate for TETRA technology to be banned from other blocks of spectrum. Users outside public safety should have access to TETRA technology resulting in greater choice and more competitive markets. The use of TETRA technology will satisfy the Commission's objectives because it remains the most spectrum efficient technology available in the LMR market.

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[35] Comments of Harris Corp. at 3

[36] *See* Comments of Motorola Solutions Inc. at 16.

Finally, the Association urges the FCC not to impose limitations that are not similarly imposed on other technologies, as doing so would not be in the best interests of U.S. consumers. As set forth in the record of this proceeding as well as the waiver proceeding, TETRA is an appropriate technology for land mobile radio operations and the FCC should adopt rules allowing for TETRA operations in the U.S.

Respectfully submitted,

The TETRA Association

/s/_____

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